

E-TAIL ATMOSPHERICS: A CRITIQUE OF THE LITERATURE AND MODEL EXTENSION

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ABSTRACT

Physical stores provide the main context for studies on retail atmospherics. Because e-tail stores differ meaningfully from physical stores, e-tail atmospherics is a distinct research domain. Eroglu, Machleit, and Davis (2001) provide a framework for the study of e-tail atmospherics. We extend that framework by introducing the concept of dual environments, integrating multidisciplinary research on virtual environments, and making conceptual and methodological suggestions for future e-tail atmospherics research.

Keywords: e-commerce, atmospherics, consumer behavior, electronic retailing

1. Introduction

Although considerable retailing literature addresses how in-store cues affect buyer behavior (see Baker, Parasuraman, Grewal, and Voss (2002) and Turley and Millman (2000) for reviews of this literature), the main context of this literature is physical stores. Because services are inseparable in such stores, buyers and sellers simultaneously occupy the same physical and temporal environment. In contrast, virtual stores often function as “post-modern environments in which time and place . . . lose meaning” (Rowley and Slack 1999, p.363). Marketing exchanges in virtual stores bridge two distinct environments: (1) the online (store) environment, and (2) the operator environment in which human-computer interactions occur. This dual environment directly and indirectly affects the ways consumers respond to shopping experiences.

The scholarly literature on retail environments draws its theoretical foundations from environmental psychology and the S-O-R paradigm (Turley and Millman 2000). This paradigm assumes that environments contain stimuli (Ss) that cause changes to people’s internal or organismic states (Os), which in turn cause approach or avoidance responses (Rs) (Mehrabian and Russell 1974). A sub-domain of the environments literature, atmospherics (i.e., “the conscious designing of space to create certain effects in buyers that enhance his purchase probabilities” (Kotler 1973-1974, p.50)) research, relies on the S-O-R paradigm to explain and present evidence pertaining to numerous environmental cues (e.g., color, lighting, music, crowding, fragrance) and their related effects on buyers’ internal states and responses.

Eroglu, Machleit and Davis (2001, 2003) lay the conceptual foundations for the extension of the S-O-R paradigm to e-tailing, and provide empirical support for significant effects of site atmospherics on shopper attitudes, satisfaction, and a variety of approach/avoidance behaviors. In accord with Eroglu, Machleit, and Davis (2003), we posit that the study of e-tail atmospherics is in its infancy and the effects of specific cues on shopper responses require further examination. We extend Eroglu, Machleit, and Davis (2001, 2003) in several ways. First, we posit that online buyer behavior occurs in *dual* environments—the online store environment and the operator environment—and explore the implications of this duality on buyers’ internal states, including the widely researched construct of telepresence. Second, we present a multidisciplinary approach for identifying variables relevant to the future study of e-tail atmospherics. Last, we add *shopper motivation* as a moderating variable for understanding the relationship between buyers’ internal states and online responses.

Figure 1 summarizes our extension of the Eroglu, Machleit, and Davis (2001) S-O-R model of consumer response to online shopping. Our exposition is organized around six new propositional relationships. (The original discussion of propositions about other model relationships can be found in Eroglu, Machleit, and Davis (2001).) We review literature relevant to these propositions, with specific attention given to the breadth and variety of variables included in previous multidisciplinary investigations of the pertinent constructs. We conclude with suggestions for advancing research and understanding of e-tail atmospherics.

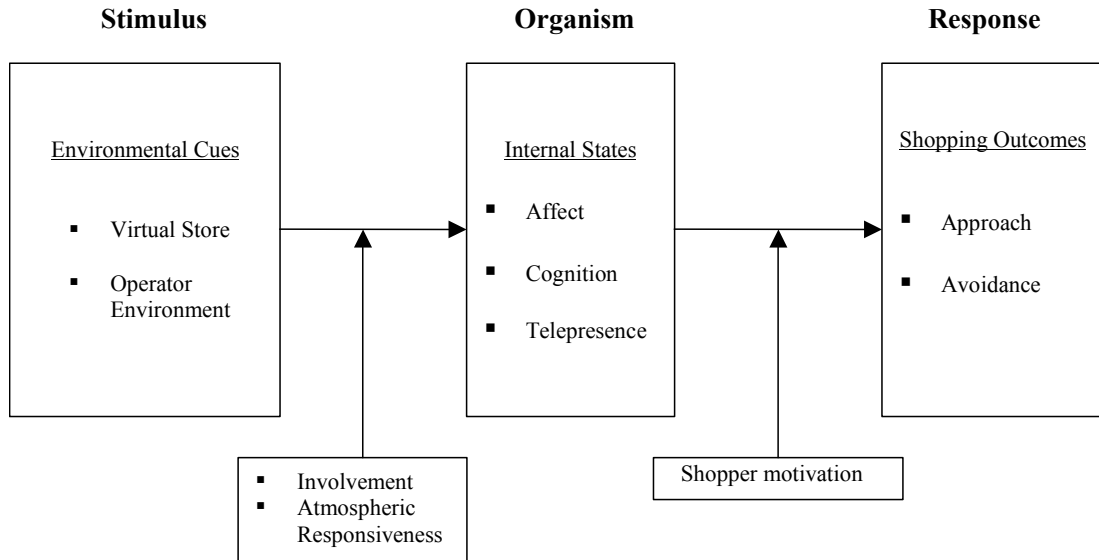


Figure 1. An S-O-R Model of E-tail Atmospherics

2. Stimulus Taxonomy

Eroglu, Machleit, and Davis (2001) assume that many atmospheric variables heretofore studied in physical stores (e.g., visible presence of others, scents, textures, temperature) are irrelevant to e-tailing. Their assumption is problematic because online shoppers operate simultaneously in two distinct environments: (1) the physical environment in which human-computer interaction occurs, and (2) the online store environment that is virtually experienced. The challenge to (r)e-tailing scholars is to integrate knowledge of these effects into a broader model of shopping behavior. We posit that (r)e-tailers must manage not only the direct effects of online store cues on shopper's internal states, but they must also anticipate and manage the effects of operator environments.

P₁: Atmospheric influences originate from dual environments: the online store environment and the operator environment.

2.1 Direct Effects of Online Store Environments

In retailing research, stimuli in physical store environments are the most heavily studied components of the S-O-R paradigm (Bitner 1992; Lunsford and Burnett 1992; Sherman, Mathur, and Smith 1997; Slama and Tashchian 1987; Spangenberg, Crowley, and Henderson 1996). Despite continuing debates about the taxonomic structure of these stimuli, this research suggests four major categories for traditional servicescapes: ambient conditions, functional/spatial elements, signs/symbols, and social elements (Aubert-Gamet 1997; Baker, Grewal, and Parasuraman 1994; Bitner 1992; Turley and Milliman 2000). Because ambience and physical space are imagined and not directly managed online, information technology and computer science research focuses on manipulation of vividness and interactivity in creating virtual environments (Bowman and Hodges 1999; Riva 1999). Although manifestations of symbols and social conditions may differ in virtual environments, these concepts are as relevant as they are in physical stores.

We agree with Eroglu, Machleit, and Davis (2001) that "the online retail environment lacks some of the dimensions (temperature, odor, textures) that are defined by [other researchers]," (p.179), yet we also believe that their simplified structure for online cues fails to integrate important contributions from other areas of online research. We suggest that the following additional elements be adapted for studies of online store environments: vividness, interactivity, symbolism, and social elements.

2.2 Vividness

Ambient conditions, the “background conditions that exist below the level of immediate awareness” (Aubert-Gamet 1997, p.29), have been a focus of research on reactions to sensory cues in physical stores (Bitner 1992). In this vein, studies of ambient conditions consider visual cues (e.g., lighting, color) (Bellizzi, Crowley, and Hasty 1983; Bellizzi and Hite 1992), auditory cues (e.g., music, noise) (Milliman 1982; North and Hargreaves 1999; Tom 1990; Yalch and Spangenberg 1990, 2000), olfactory cues (e.g., scents) (Hirsch 1995; Mitchell, Kahn, and Knasko 1995), and tactual cues (e.g., temperature) (Griffitt 1970). For virtual settings, the range of ambient conditions is constrained by current technology; specifically, only visual and auditory stimuli are now used. Although scent transfer is feasible (e.g., DigiScent) (Caulfield 2000), it is unavailable to most online shoppers.

Vividness is the richness of environmental information presented to human senses (Shih 1998; Steur 1992). Media (e.g., television) vividness is a function of two dimensions: (1) depth, which is the resolution or fidelity of sensory information, and (2) breadth, which is the number of sensory dimensions concurrently activated (Shih 1998; Steur 1992). Although research on vividness confirms its significance in online shopping (Coyle and Thorson 2001), how the depth and breadth dimensions interact to affect consumers’ behaviors is unknown. For example, if a compensatory model underlies media vividness, then improved performance on one dimension (e.g., breadth—use of more sensory modes) can compensate for deficient performance on the other dimension (e.g., depth—use of fewer visual stimuli).

Although vividness is a desirable feature of virtual stores, excessive stimulation—as in physical stores—may overwhelm consumers (Steenkamp and Baumgartner 1992). In conventional advertising, the positive effect of vivid information follows an inverted U-shaped curve (Keller and Block 1997). If online responses are similar, then e-tailers must consider the cumulative function of vividness breadth and depth and recognize trade-offs in expanding the richness and diversity of sensory cues.

2.3 Interactivity

As many researchers recognize, there is little agreement on the definition of interactivity (Heeter 2003; Klein 2003). Within our proposed framework, interactivity is presented as a design characteristic of virtual store environments. Specifically, interactivity is defined as the susceptibility and responsiveness of computer-mediated environments to user control (Ariely 2000; Klein 2003; Steur 1992). The effect of interactivity on telepresence (Coyle and Thorson 2001; Klein 2003) and some evaluative aspects of online buyer performance (Ariely 2000) are well known. Future research should consider the direct effects of interactivity on a broader range of organismic variables. For example, reduced interactivity may frustrate consumers and decrease their pleasure (Dailey 2001). Alternatively, opportunity for enhanced interactivity, regardless of realization, may yield perceptions of greater navigational ease and enhance pleasure derived from online experiences (Childers et al. 2001). Enhanced control should also boost feelings of dominance/control when interacting with e-tail websites.

2.4 Symbolism

In physical stores, symbols serve as “explicit or implicit signals to communicate about the place to its users” (Bitner 1992, p.66). Such symbols may be more important when shoppers cannot easily ask for a clerk’s assistance, as they can in physical stores. Given the importance of navigation in virtual environments, many symbols are incorporated expressly for function or design. The extent to which such symbols successfully facilitate navigation will often be critical to the success of shopping experiences. Signs not meant to promote navigational ease can be used to indicate site credibility and sponsor integrity/reputation. Certification and rating services, such as eTrust, Verisign and BizRate, use graphic brand marks to indicate their *stamp of approval* on certified sites. Alternative cues for judging site credibility can derive from design elements such as affiliate linkages (Putcha 2001) and traffic counters. These and other common web design tools can transmit important symbolic messages that should be further explored in understanding e-tail atmospherics.

2.5 Social Elements

The social elements in physical stores include crowding and the appearance and/or demeanor of shoppers and employees (Baker, Grewal, and Parasuraman 1994). Although there is no “visible presence of other shoppers and employees...in the online retail environment (Eroglu, Machleit, and Davis 2001, p.179), e-tail websites offer other representations of interpersonal interaction; specifically, shopping agents and online communities.

By definition, a shopping agent is an interactive tool designed to help shoppers process product information and make purchase decisions online (Häubl and Trifts 2000). Shopping agents can mimic the role of salespeople in physical stores. Many e-tail site designers create virtual bodies or avatars that can act as representations of salespersons and/or online shoppers (Morgan 1999). Agents can facilitate search or support choice (Häubl and Trifts 2000; Sproule and Archer 2000) and will likely influence customer’s affective and cognitive states.

Social factors, including dimensions of salespersons’ performance, affect customers’ pleasure and arousal (Baker, Levy, and Grewal 1992). If, as in traditional servicescapes, consumers self-select how and to what extent a sales assistant is involved, then they should find that an agent increases their shopping pleasure and feelings of

control in service encounters. Attempts to embody shopping agents as avatars suggests that people prefer the illusion of human touch even if they self-create, and thus recognize, the falsity of this perception. This welcomed illusion suggests various opportunities for studying the effects of social elements in website design. For example, shopping agents can create trust and build relationships in online environments (Papadopoulou et al. 2001), which means their availability may reduce consumers' assessments of perceived risk and boost their positive affect toward the website.

The use of communication tools to build online communities may be critical to e-tailing success (McWilliam 2000). Some scholars are skeptical about online community building and report that community is unrelated to e-tail effectiveness (Wolfenbarger and Gilly 2002). However, their research has focused on online purchasers and not shoppers who may use (r)e-tail websites to support or facilitate purchase in physical stores. Such a focus may underestimate the effects of online communities on consumers' internal states. Other scholars argue that online communities are "likely to shift power from vendor to customer by reducing or eliminating the information advantages that vendors currently enjoy. . . (and) will allow innovative marketers to move closer to treating customers as segments of one" (Armstrong and Hagel 1997, p.142). In other words, active online communities may improve consumers' emotional responses to website design and lead to more positive cognitive appraisals of web design features.

P₂: Dimensions of online store environments include vividness, interactivity, symbolism, and social elements.

3. Telepresence and Complementary Effects on Dual Environments

"Presence is defined as the sense of being in an environment" (Steuer 1992, p.75), and thus reflects people's perceptions of their physical surroundings. When presence is extended to people's sense of immersion in communications media, it is called telepresence. Specifically, Steuer (1992) defines telepresence as "the extent to which one feels present in the mediated environment, rather than in the immediate physical environment" (p.76). Significant support exists for the value of this construct in studying computer-mediated and online environments (Coyle and Thorson 2001; Hoffman and Novak 1996; Klein 2003; Nichols, Haldane, and Wilson 1999; Novak, Hoffman, and Yung 2000; Shih 1998; Steuer 1992).

Within the S-O-R framework, telepresence provides an interesting twist on traditional approaches to studying retail environments. Bitner (1992) originally proposed servicescapes as an organizing framework for studying environmental influences on retail services, and included an S-O-R model with internal states comprised of emotional, cognitive, and physiological components. Unlike the model in Bitner (1992), the model in Eroglu, Machleit, and Davis (2001, 2003) does not explicitly consider how physical environments affect physiological internal states. Telepresence provides a way to address this gap in the model, albeit in a somewhat reverse fashion. Specifically, telepresence is the extent that people can desensitize themselves to their immediate physical environment; in the case of online shoppers, the operator environment. The greater the telepresence, the less aware shoppers are of physiological stimulation from operator environments.

P₃: Telepresence mediates the relation between (a) the dual environments of the online store and operator environments, and (b) shopping outcomes (approach/avoidance).

4. Organismic States

We have argued for telepresence as an organismic state in e-tailing S-O-R models. Within the traditional retail atmospherics literature there is a legacy of research about environmental effects on consumers' affective states, but little research about consumers' emotional responses to website design. Traditionally, research examining online store effectiveness stresses cognitive appraisals in monitoring consumers' reactions to website design (Dholakia and Rego 1998, Huizingh 2000; Szymanski and Hise 2000). We now try to bridge the gap between the study of retail and e-tail environments by highlighting particular issues or variables of interest in studying the organismic component of e-tailing S-O-R models.

4.1 Affective States

Researchers use various measures to capture the effect of retail atmospherics on consumers (Donovan et al. 1994; Havlena and Holbrook 1986). The Pleasure, Arousal, and Dominance (PAD) triad (Mehrabian and Russell 1974) is the de facto standard, although both Plutchik's eight-emotion and Izard's ten-emotion structures provide reasonable alternative frameworks of emotional states (Machleit and Eroglu 2000). The reliability of the PAD's dominance dimension proved so problematic in preliminary research on the S-O-R model (Eroglu, Machleit, and Davis 2003) that the dimension was dropped. However, theoretical and empirical evidence suggests that efforts to explore the dominance dimension in studies of online environments may be warranted.

In commenting about the relevance of control and justifying renewed interest in the PAD's dominance dimension to studies about e-tail buyer behavior, Foxall and Greenley (2000) note, "[D]ominance is expected to increase with the openness of consumer behavior settings, the extent to which behavior in the setting is under the

control of the consumer rather than some other agent, such as a marketing manager” (p.152). Consumers in traditional servicescapes voice opinions about service settings, but service providers ultimately control the structure and design of physical stores (Aubert-Gamet 1997). Conversely, many websites encourage consumers to self-select the design and content of their online environment. Technologies such as Active Server Pages (ASP) use data stored in previously deposited cookies to automatically adapt the content and sequencing of web pages to each website visitors’ habits and preferences. Essentially, ASP-type technologies help consumers to co-create their virtual store environments.

Clearly, research to explore the value of different emotion measures in studying e-tail environments is warranted. Specific attention should be devoted to delineating user control as a design feature (i.e., a stimulus factor) and emotional responses to that control. Previous studies on the role of emotion in marketing show that the emotion measure chosen is critical and must be considered within the research context (Bagozzi, Gopinath and Nyer 1999). We contend that previous conclusions to drop the dominance dimension from studies of retail environments may have been appropriate for physical stores, but cannot be assumed for e-tail environments. Scale development that focuses on emotional response to gains/limits in control should be an important avenue for future e-tailing research.

4.2 Cognitive States

The specification of attitude as an organismic variable in Eroglu, Machliet, and Davis (2003) provided a good starting point for an S-O-R e-tailing model. The e-commerce literature reveals many other possibilities for future study of cognitive states, including ease of navigation, perceived risk/security, personalization, and informativeness.

Ease of navigation is frequently used to assess website efficacy (Chen and Wells 1999; Hoque and Lohse 1999; Huizingh 2000; Lynch and Ariely 2000; Morris-Lee 2000) and is analogous to ease of navigation in physical stores. Because consumers are *cognitive misers*, they prefer familiar environments that are easily navigated, memorized, and comprehended (Park and Hastak 1994; Park, Iyer, and Smith 1989). Cognitive flexibility theory suggests that the more ill-structured and complex a website, the more cognitive resources consumers will use to learn it (Spiro and Jehng 1990). Thus, if a website is hard to navigate and comprehend, and if switching costs are minimal, then consumers may be less likely to exhibit approach behaviors in response to an online shopping experience.

Perceived risk associated with e-tail environments impels many consumers to limit their activity online (Hoffman, Novak, and Peralta 1999). Certification and rating services, such as eTrust, Verisign, and BizRate, originated out of online shoppers’ needs for assurance and security. Although current research focuses on the way perceived risk affects transaction likelihood and site evaluation (Szymanski and Hise 2000), discrepancies and irregularities in reported findings suggest further study is needed (Bellman, Lohse, and Johnson 1999).

Personalization, or the ability to give individualized attention, is often cited as an important driver of satisfaction in traditional service settings (Bitner, Booms, and Tetreault 1990; Brown and Swartz 1989). Although “personalized service refers to any behaviors occurring in the interaction intended to contribute to the individuation of the customer” (Suprenant and Solomon 1987, p.87), some definitions of personalization stipulate social interactions as a requisite component (Mittal and Lassar 1996). Alternatively, e-tail studies on personalization have focused on customization of website content and shopper communications (Coner 2003). Given its predictiveness in retail settings, application of traditional approaches to personalization as a socially dependent construct should augment knowledge of e-tail atmospherics (Mittal and Lassar 1996; Suprenant and Solomon 1987).

Informativeness—the extent to which websites supply useful information to consumers—has also been studied as usefulness, merchandising, and information content (Chen and Wells 1999; Childers et al. 2001; Szymanski and Hise 2000; Wolfenbarger and Gilly 2002). By reducing search costs, a (r)e-tail website can increase the amount and quality of product information considered by consumers (Hoque and Lohse 1999; Lynch and Ariely 2000). Informativeness and depth of information tend to predict consumer evaluations of website design, including attitude toward the site, satisfaction with the site, and loyalty intentions (Chen and Wells 1999; Szymanski and Hise 2000; Wolfenbarger and Gilly 2002). Because previous research has focused on informativeness and online purchase only, future research should consider the role of informativeness for consumers who use websites for non-purchase reasons (e.g., gathering price information).

P₄: Internal states relevant to the study of e-tail atmospherics include affective states, cognitive states, and telepresence.

5. Response Taxonomy

The original application of environmental psychology to the study of retail environments in Donovan and Rossiter (1982) characterized relevant atmospheric response variables based on four elements:

- (1) A desire to *physically* stay in (approach) or exit (avoid) the environment.
- (2) A desire to *explore* (approach) or ignore (avoid) the environment.
- (3) A desire to *communicate* with (approach) or ignore (avoid) others.

(4) The degree of enhancement (approach) or hindrance (avoid) of *performance and satisfaction* with task performances.

Clearly, many variables can be used to operationalize the response construct in online shopping; typically these include items measuring time/money spent at a site, enjoyment, and evaluations of goodness/badness of a site. We suggest that store exploration, communications with others, and flow merit special comment given the dearth of e-tail atmospherics research on these response variables and their likely value to studies about online store environments.

5.1 Store Exploration

Despite its conceptual importance, retailing scholars have attended little to store exploration; other than shoppers' willingness to explore stores (Donovan and Rossiter 1982), "little (else) is known about the process by which consumers physically search through retail shopping environments" (Titus and Everett 1995, p.106). This deficiency is at least partly due to difficulties in tracking and measuring retail search. (R)e-tail websites offer easier access to store search data; for example, cookies allow e-tailers to track consumers' online movements as well as frequency of visits. With log analysis tools, web page designers can learn consumers' entry points and site use (i.e., what links were followed and in what order). Although these tools have their limitations (Moe and Fader 2001), a better understanding of online store search patterns may help retailing scholars better ground their theories on search patterns in all servicescapes.

5.2 Online Communications

Researchers have attended little to the ways environments affect consumers' behaviors and desires to communicate with others in retail settings (Dube, Chebat, and Morin 1995; Hui, Dube, and Chebat 1997). Although the reasons for this deficiency are unclear, new interest in these behaviors and desires is relevant to virtual stores. For example, many information technology practitioners believe that consumers' willingness to volunteer personal data is critical to e-commerce (e.g., Labuschagne and Eloff 2000). Tools such as data mining and log analysis rely on personal data disclosed by customers.

If increasing privacy concerns and future online regulations constrain e-tailers' ability to collect self-report data, then the mass customization potential for e-tailing may never come to fruition. Nonetheless, using bulletin boards, chat rooms, and e-mail to build online communities is controversial. Although some research suggests that online shoppers often ignore the tools used to build online communities, evidence also suggests that these shoppers want greater opportunities to provide feedback and information via marketers' websites (Pastore 2002). The extent to which websites prompt such communications may have important implications for brand loyalty and customer relationship management.

5.3 Flow

The concept of *flow* (Csikszentmihalyi 1977, 1990, 1997) has drawn considerable attention in marketing studies of computer-mediated environments (Hoffman and Novak 1996). Flow denotes a state of experience in which a person's skills are optimally matched to the challenges of a focal task, ultimately producing an enjoyable state of complete immersion and absorption in that task. Flow is "the state occurring during network navigation which is: (1) characterized by a seamless sequence of responses facilitated by machine interactivity, (2) intrinsically enjoyable, (3) accompanied by a loss of self-consciousness, and (4) self-reinforcing" (Hoffman and Novak 1996, p.57). If changes in a consumer's environment can affect flow, then they are critical to the broader e-tailing framework. Although flow is not typically studied as a function of a given website, it originates from web navigation during an online session, and thus is a function of experiences with all websites visited during that session (Novak, Hoffman, and Yung 2000). Future research should examine how environmental factors associated with specific (r)e-tail websites enhance or hinder flow, and how the consequences for flow affect consumers' ongoing willingness to interact with (r)e-tail websites.

P₅: The range of appropriate approach/avoidance behaviors for the study of e-tail atmospherics includes, but is not limited to, store exploration, online communications, and flow.

6. Moderating Effect of Shopper Motivation

Empirical studies of online shopping behavior typically focus on the restricted class of online purchasers rather than the broader class of online shoppers (Chen and Wells 1999; Szymanski and Hise 2000; Wolfinger and Gilly 2002; Zeithaml, Parasuraman and Malhotra 2000). Given shoppers' propensity to use the Internet more for research rather than for buying, future research should examine how shopper motivations affect reactions to e-tail atmospherics. For example, shopper motivation moderates the affect of web design on online shopping attitudes; specifically, the instrumental and immersive features of website design influence shopper responses, yet the exact nature of these influences depends on context and shopper motivation (Childers et al. 2001).

Shopper motivation takes on additional significance as businesses move toward greater use of multi-channel retailing. More and more retailers are using a clicks-and-mortar model, which allows consumers to use different channels for various services (e.g., product research, comparison shopping, purchase, after sales service, et cetera). It is likely that consumers' approach to online shopping as a hedonic and/or utilitarian function will moderate the relative importance of telepresence, cognitive states, and affective states as predictors of shopping outcomes. We posit that telepresence and affective states are most predictive when online shoppers seek a hedonic shopping experience; thus, website designers should focus on the site elements most conducive to generating an immersive and emotional shopping experience. In contrast, online shoppers motivated by utilitarian needs will focus on efficient and effective delivery of wanted information and/or the completion of desired tasks; in such cases, environmental cues that facilitate positive cognitive appraisals of online experiences may be most important in explaining consumer responses to e-tail atmospherics.

P₆: Cognitive states (affective states and telepresence) will be powerful predictors of shopping outcomes for online shoppers with utilitarian (hedonic) motivations.

7. Implications and Future Research

Our extended framework and e-tail atmospheric typology suggest a wide range of research avenues. Given the paucity of extant research, both theoretical and empirical studies should prove valuable to retailing scholars and practitioners. By focusing on online purchase, researchers have ignored the facilitating effect of e-tail environments on future purchases in other channels. With improved understanding of how shoppers' motivations affect their responses, retailers' website design decisions will improve.

Given the complexity of e-tail atmospherics, researchers should use multiple methodological approaches to study the relationships posed by our S-O-R model. Experimental methods can be used to explore the role of dual environments on internal states. In designing treatment conditions, i.e., different websites, researchers can manipulate both online cues and operator environments. By controlling these two conditions, their combined effects on subjects' internal states can be studied. Then researchers can use standard survey methods to assess these states, although they should carefully consider the measurement issues. Standardized scales for assessing perceived risk, informativeness, and other cognitive appraisals can be easily adapted to the context; it is affective measures that require more careful consideration. Structural equation modeling may be a valuable method of analysis for exploring relationships between the organism and response constructs of the S-O-R model. Comparison of model fit in describing the data from shoppers with different motivations can be used to explore moderating influences.

Measurement development is another important avenue of research, particularly with respect to affective states and approach/avoidance behaviors. Direct comparison of alternative emotion measures can provide a starting point for investigating how technical aspects of user control (i.e., levels of interactivity) affect emotional states of online shoppers. The nature of e-tail environments may require development of specific emotion measures that better capture user feelings of frustration or accomplishment in interactions with online store environments. Similarly, variables such as store exploration and online communications may require integration of both technical and subjective approaches to measurement. For example, store exploration may require a multi-method approach using log analysis data, direct observation, and subjective assessments of willingness to explore. Internet technology affords researchers a greater range of possibilities in measurement development. The concepts of flow and telepresence have a wide base of research in the computer science and ergonomics literatures. Once again, we should integrate these domains to provide a more holistic approach to the psychology of online environments.

The concept of dual environments offers important possibilities for empirical study and development of retailing strategy. (R)e-tailers increasingly use online storefronts to facilitate consumer purchase. Traditionally, research has focused on the use of online stores as a channel of distribution in which purchases are made. This narrow focus severely limits understanding of how e-tail sites enhance retail outcomes. For example, in-store retailers often provide access to computer terminals or POS kiosks so that consumers can access product/store information on company websites. Understanding how environmental aspects of operator environments affect consumers' responses to online store environments will encourage a more synergistic approach to design decisions for all store environments. Future research on dual environments will likely reveal the need for multiple store websites designed to accommodate users accessing the sites from different locations and for different purposes.

8. Conclusion

A decade ago, few retailers predicted the current range and growth of commercial activities on the Internet. Although online sales remain a small fraction of total sales, firms will continue to expand their online presence. This trend mandates greater exploration of e-tailing and underscores the need for a systematic study of online shopping behavior. Since the early 1970s, social scientists have studied the relationship between human behavior and

sociophysical environments. Knowledge of this relationship influences decisions ranging from the architectural design of schools to the layout of urban communities. One notion common to all such decisions is the emphasis on an environment in which people are physically present. With the emergence of the Internet, this physical presence requirement no longer pertains. Today, environmental influences can be derived from contexts in which people are mentally present but physically removed.

E-tail environments provide sensory stimuli analogous to physical stores, but require consumers to divide their attention between two environments: the virtual store environment and the operator environment. Understanding how such dual environments affect consumers is important not only to e-tailers, but to consumer researchers in general. Similarly, there is a need to review and extend knowledge of organismic states and their consequences for understanding atmospheric effects on online shopping behaviors. The S-O-R framework for e-tailing offers researchers a structure for studying the dynamics of online buyer-seller relationships. We hope our extension to the work of Eroglu, Machleit, and Davis (2001, 2003) provides a more robust perspective for advancing knowledge of e-tail atmospherics.

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